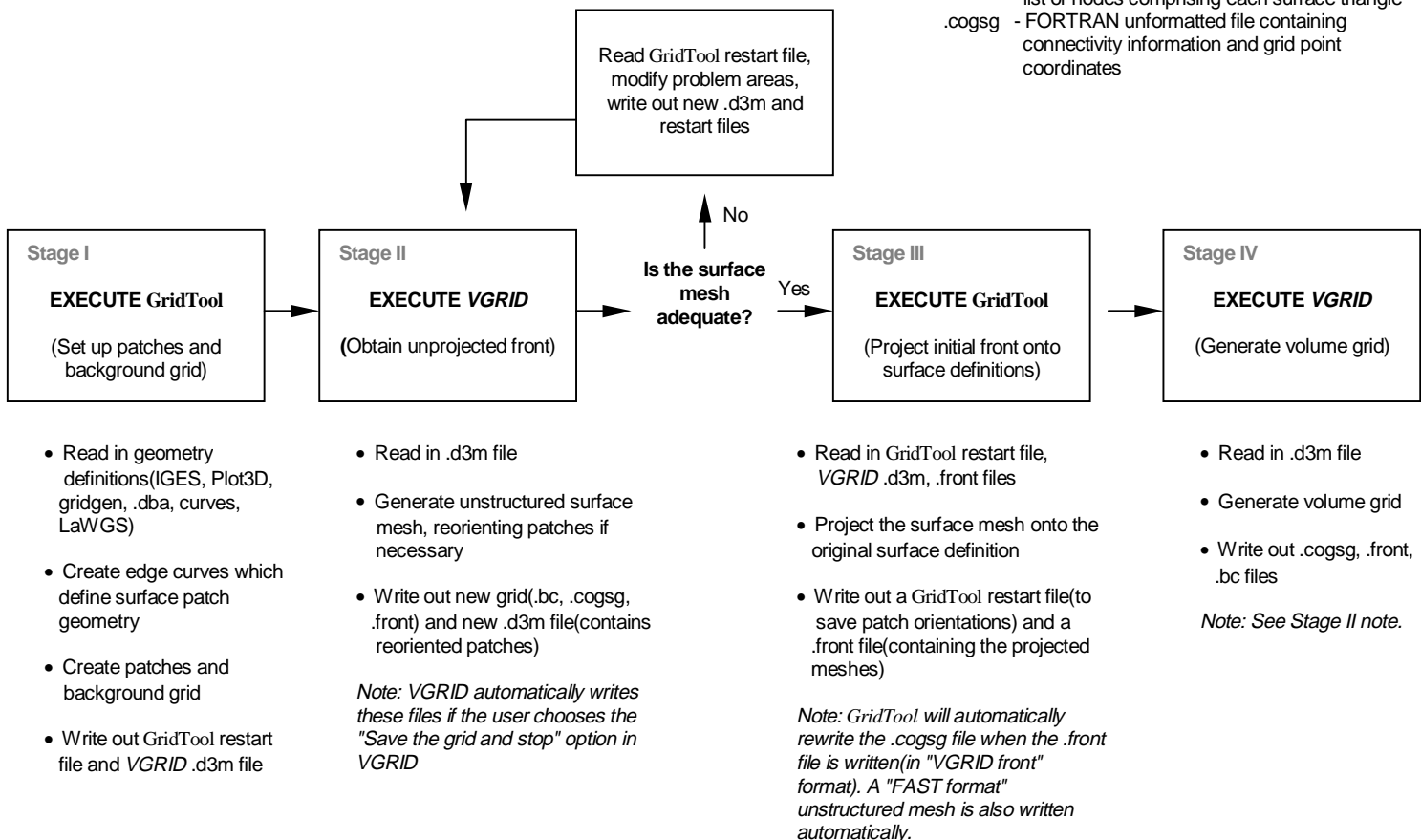# GridTool/*VGRID* Event Sequence

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File Nomenclature:

.d3m   - *VGRID* input file
.mapbc - List of patches and boundary conditions on each
.bc   - List of surface triangles, node numbers, and the surface patch on which each lies
.front - List of unprojected coordinates of each node, and list of nodes comprising each surface triangle
.cogsg - FORTRAN unformatted file containing connectivity information and grid point coordinates

Read GridTool restart file, modify problem areas, write out new .d3m and restart files

Is the surface mesh adequate?   No   Yes

Stage I	Stage II	Stage III	Stage IV
EXECUTE GridTool (Set up patches and background grid)	**EXECUTE *VGRID*** (Obtain unprojected front)	**EXECUTE GridTool** (Project initial front onto surface definitions)	**EXECUTE *VGRID*** (Generate volume grid)

Stage I

- Read in geometry definitions(IGES, Plot3D, gridgen, .dba, curves, LaWGS)

- Create edge curves which define surface patch geometry

- Create patches and background grid

- Write out GridTool restart file and *VGRID* .d3m file

Stage II

- Read in .d3m file

- Generate unstructured surface mesh, reorienting patches if necessary

- Write out new grid(.bc, .cogsg, .front) and new .d3m file(contains reoriented patches)

Note: VGRID automatically writes these files if the user chooses the "Save the grid and stop" option in VGRID

Stage III

- Read in GridTool restart file, *VGRID* .d3m, .front files

- Project the surface mesh onto the original surface definition

- Write out a GridTool restart file(to save patch orientations) and a .front file(containing the projected meshes)

Note: GridTool will automatically rewrite the .cogsg file when the .front file is written(in "VGRID front" format). A "FAST format" unstructured mesh is also written automatically.

Stage IV

- Read in .d3m file

- Generate volume grid

- Write out .cogsg, .front, .bc files

Note: See Stage II note.

General Comments:

- When generating an inviscid mesh, the volume grid generation process may be performed entirely in batch mode. When generating a viscous mesh, the generation of the viscous portion of the volume grid must be done interactively.

- During viscous grid generation, it is recommended that the viscous portion of the volume mesh be written out before proceeding to the inviscid portion. Once saved, the user should again run *VGRID* and generate the inviscid portion of the mesh.

- Since the user does not know *a priori* how many tetrahedra will result from the volume mesh generation process, it is suggested that the user proceed from Stage II to Stage IV to generate a volume. This will determine if the tetrahedron count is "too large" as well as point out problems requiring re-gridding and thus a return to Stage I.

- It is good practice to save the unprojected surface mesh file from Stage II prior to proceeding to Stage III in case a resulting volume mesh proves unacceptable as a consequence of projection.